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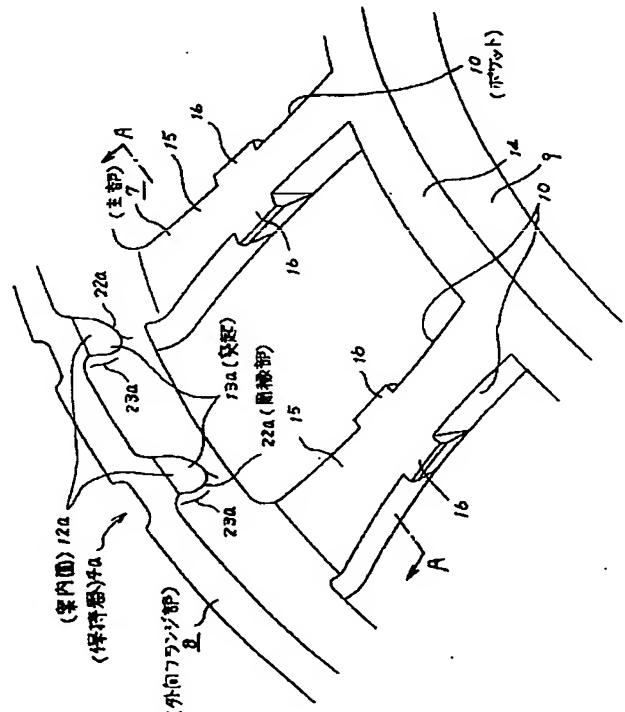
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(54) 【発明の名称】 ころ軸受用保持器

(57) 【要約】

【課題】 応力集中を緩和する事により、耐久性向上を図る。

【解決手段】 保持器4aの外側フランジ部8で球面ころの端面に対向する部分に、ポケット10、10の内側に突出する突起13a、13aを設ける。そして、これら各突起13a、13aの先端面である案内面12a、12aの周縁部22aの形状を、尖鋭部を持たない曲線形状とする。



**【特許請求の範囲】**

**【請求項 1】** 金属板製で円筒状若しくは円すい筒状の主部と、この主部の円周方向に互って間欠的に設けられた複数のポケットと、上記主部の一端縁から直径方向外方若しくは内方に折れ曲がった、上記主部と一体のフランジ部と、このフランジ部の片側面で上記各ポケット内に転動自在に保持された複数のころの端面と対向する部分に、上記各ポケットの内側に向け突出する状態で上記各ポケット毎に少なくとも 1 個ずつ設けられ、上記各ポケットの内側に対向する面を上記各ころの端面と摺接する案内面とした突起とを備えたころ軸受用保持器に於いて、上記案内面の周囲を区画する周縁部のうち、少なくとも上記各ころの端面と摺接する部分の形状を円弧形とする事により、当該部分の形状を尖鋭部を持たない曲線形状とした事の特徴とするころ軸受用保持器。

**【発明の詳細な説明】****【0001】**

**【発明の属する技術分野】** この発明に係るころ軸受用保持器は、例えば自動調心ころ軸受に組み込んで、この自動調心ころ軸受を構成する球面ころを転動自在に保持するのに利用する。

**【0002】**

**【従来の技術】** 例えば特開平 8-296653 号公報には、図 7 に示す様な自動調心ころ軸受が記載されている。この自動調心ころ軸受は、互いに同心に組み合わされた外輪 1 と内輪 2 との間に、請求項に記載したころに相当する複数の球面ころ 3、3 を転動自在に配列して成る。そして、ころ軸受用保持器である 1 対の保持器 4、4 により、上記複数の球面ころ 3、3 の分離防止を図っている。上記各保持器 4、4 は、金属板をプレス成形して成る、所謂プレス保持器である。

**【0003】** 上記外輪 1 の内周面には、単一の中心を有する球状凹面である外輪軌道 5 を形成している。又、内輪 2 の外周面の幅方向（図 7 の左右方向）両側には、それぞれが上記外輪軌道 5 と対向する、1 対の内輪軌道 6、6 を形成している。又、上記複数の球面ころ 3、3 は、その最大径部が各球面ころ 3、3 の軸方向長さの中央部にある対称形で、上記外輪軌道 5 と上記 1 対の内輪軌道 6、6 との間に、2 列に互って転動自在に配列している。

**【0004】** 上記各保持器 4、4 は、前述した様に、鋼板等の金属板にプレス加工を施す事により造っている。これら各保持器 4、4 は、図 6 に示す様に、円すい筒状の主部 7 と、この主部 7 の円周方向に互って間欠的に、互いに等間隔で形成した複数のポケット 10、10 とを備える。上記主部 7 の一端縁である大径側端縁部（図 6 の左上端部）には、この大径側端縁部から直径方向外方に折れ曲がった、請求項に記載したフランジ部に相当する外向フランジ部 8 を、上記主部 7 の他端縁である小径側端縁部（図 6 の右下端部）には、この小径側端縁部か

ら直径方向内方に折れ曲がった内向フランジ部 9 を、それぞれ設けている。この様な保持器 4、4 を自動調心ころ軸受に組み込んだ状態で、上記各ポケット 10、10 には、それぞれ 1 個ずつの球面ころ 3、3（図 7 参照）を、転動自在に保持する。

**【0005】** 上述の様な各保持器 4 は、上記複数のポケット 10、10 の存在により、上記主部 7 の一端部に設けられた上記外向フランジ部 8 と、上記主部 7 の他端部に設けられた円環部 14 と、これら外向フランジ部 8 と円環部 14 とを連結する複数の柱部 15、15 とに分れる。上記円環部 14 の外端縁には、上記内向フランジ部 9 を折り曲げ形成している。言い換えれば、上記各ポケット 10、10 は、上記外向フランジ部 8 と円環部 14 と円周方向に隣り合う柱部 15、15 同士とにより円周を囲まれた部分に設けられている。これら各柱部 15、15 の中央部には、それぞれ上記各ポケット 10、10 の内側に突出する突片 16、16 を設けて、これら各ポケット 10、10 に内径側から挿入された上記各球面ころ 3、3（図 7）が外径側に抜け出ない様にしている。

**【0006】** 又、上記外向フランジ部 8 の片側面で、上記各ポケット 10、10 内に転動自在に保持された複数の球面ころ 3、3 の端面 11、11（図 7）と対向する部分には、突起 13、13 を、上記各ポケット 10、10 の内側に向け突出形成している。これら各突起 13、13 は、上記各ポケット 10、10 毎に 2 個ずつ、互いに円周方向に離隔させた状態で設けたもので、上記各ポケット 10、10 の内側に対向する面を、上記各球面ころ 3、3 の端面 11、11 と摺接する案内面 12、12 としている。保持器 4 を、図 7 に示した自動調心ころ軸受に組み込んだ場合には、上記各ポケット 10、10 の内側に突出した上記各突起 13、13 の案内面 12、12 が上記各球面ころ 3、3 の端面 11、11 と近接若しくは摺接し、これら各球面ころ 3、3 の他端面が円環部 14 の内端縁と摺接若しくは近接する。この為、これら各球面ころ 3、3 が上記各ポケット 10、10 に対して変位する事を有効に防止できる。即ち、上記各球面ころ 3、3 の両端面と上記各突起 13、13 の案内面 12、12 或は上記円環部 14 の内端縁との間には、隙間が存在しないか、存在しても僅かな隙間しか存在しない。この為、これら各球面ころ 3、3 の中心軸は上記各ポケット 10、10 の中心線に対して傾斜しないか、傾斜しても極く僅かしか傾斜しない。径の大きな保持器 4 の中心は自動調心ころ軸受の中心に対して殆ど傾斜しない為、上記各球面ころ 3、3 が上記各ポケット 10、10 の内側で傾斜する事を防止すれば、これら各球面ころ 3、3 がスキューする事を確実に防止できる。

**【0007】**

**【発明が解決しようとする課題】** 上述の様に構成される従来のころ軸受用保持器の場合は、上記各案内面 12、12 の端縁形状を矩形にしている。従って、これら各案

内面 12、12 の周囲を区画する周縁部 22、22 には、曲率半径が極く小さい尖鋭部 17、17（図 6 参照）が存在する。又、各突起 13、13 の基部 23、23 の曲率半径も相当に小さい。この為、上記各案内面 12、12 と球面ころ 3、3 の端面とが擦れ合ったり、或は上記各案内面 12、12 と球面ころ 3、3 の端面 11、11 とが繰り返し衝突した場合には、上記各尖鋭部 17、17 や基部 23、23 に応力が集中し、これら各基部 23、23、特に上記各尖鋭部 17、17 に近い部分に亀裂等の損傷が発生し易い。本発明は、この様な応力の集中を防止し、ころ軸受用保持器の耐久性向上を図るべく発明したものである。

#### 【0008】

【課題を解決するための手段】本発明のころ軸受用保持器は、前述した従来のころ軸受用保持器と同様に、金属板製で円筒状若しくは円すい筒状の主部と、この主部の円周方向に互って間欠的に設けられた複数のポケットと、上記主部の一端縁から直径方向外方若しくは内方に折れ曲がった、上記主部と一体のフランジ部とを備える。そして、このフランジ部の片側面で上記各ポケット内に転動自在に保持された複数のころの端面と対向する部分には、上記各ポケットの内側に向け突出する状態で上記各ポケット毎に少なくとも 1 個ずつの突起を設けている。これら各突起は、上記各ポケットの内側に対向する面を、上記各ころの端面と摺接する案内面としている。特に、本発明のころ軸受用保持器は、上記案内面の周囲を区画する周縁部のうち、少なくとも上記各ころの端面と摺接する部分の形状を円弧形とする事により、当該部分の形状を尖鋭部を持たない曲線形状としている。

#### 【0009】

【作用】上述した本発明のころ軸受用保持器の場合、上記案内面の周囲を区画する周縁部の形状を円弧形とする事により、使用時に上記案内面ところの端面とが擦れ合ったり、繰り返し衝突した場合にも、上記周縁部及び基部に大きな応力集中が発生しにくくなり、この基部に亀裂等の損傷が発生しにくくなる。

#### 【0010】

【発明の実施の形態】図 1～3 は、本発明の実施の形態の第 1 例を示している。本例のころ軸受用保持器の基本構造は、前述した従来構造と同様である。特に、本例のころ軸受用保持器は、突起 13a、13a の案内面 12a、12a の周囲を区画する周縁部のうち、少なくとも各球面ころ 3 の端面 11（図 7 参照）と摺接する部分の形状を尖鋭部 17、17（図 6 参照）を持たない曲線形状とし、これに伴って上記各突起 13a、13a の基部 23a、23a の断面の曲率半径を大きくしている点が、従来構造とは異なる。その他の部分の構造及び作用は、基本的には前述の図 6 に示した従来構造と同様であるから、同等部分には同一符号を付して、重複する説明を省略若しくは簡略にし、以下、本発明の特徴部分の中

心に説明する。

【0011】本例のころ軸受用保持器である保持器 4a の場合には、上記案内面 12a、12a の周囲を区画する周縁部 22a、22a のうち、少なくとも上記各球面ころ 3 の端面 11 と摺接する部分となる、上記各周縁部 22a、22a の内径側（図 1～2 の下側）部分の形状を半円弧形とする事により、この内径側部分の形状を、上記各尖鋭部 17、17（図 6 参照）を持たない曲線形状としている。

【0012】上述の様に本例の保持器 4a は、上記案内面 12a、12a の周縁部 22a、22a のうち、球面ころ 3 の端面 11 と擦れ合う部分の形状を半円弧形としている。この為、上記各周縁部 22a、22a のうち、上記端面 11 との擦れ合いに基づいて応力を受ける部分には、形状が急激に変化する部分がなく、上記端面 11 との擦れ合いに基づいて上記各周縁部 22a、22a に発生する応力が、部分的に集中する事がなくなる。又、上記周縁部 22a、22a の形状を半円弧形とした事に伴い、上記各突起 13a、13a の基部 23a、23a のうち、上記半円弧形部分に対応する部分の断面形状の曲率半径を大きくしている。従って、上記各基部 23a、23a への応力集中も緩和される。この結果、本例の保持器 4a の使用時には、上記各突起 13a、13a に亀裂等の損傷が発生しにくくなって、上記保持器 4a の耐久性が向上する。

【0013】上述の様に本例の保持器 4a は、上記案内面 12a、12a の周縁部 22a、22a の形状を、内径側のみ変更する事により、従来構造に対し最小限の変更で、本発明の目的である耐久性向上を達成している。尚、上記周縁部 22a、22a のうち、上記球面ころ 3 の端面 11 と擦れ合う内径側部分を、図 1～2 に表した周縁部 22a、22a 自体の形状を円弧形にするだけでなく、図 3 に表した断面形状を、極力曲率半径が大きな円弧形にすれば、上記端面 11 との擦れ合いや繰り返しの衝突に基づく応力集中を、より一層緩和できる。

【0014】次に、図 4～5 は、本発明の実施の形態の第 2 例を示している。本例の保持器 4b の場合には、突起 13b、13b の案内面 12b、12b の周縁部 22b、22b の形状を円形に形成している。この様に、これら各周縁部 22b、22b の形状を円形とした場合には、球面ころ 3 の端面 11 と上記案内面 12b、12b との擦れ合い衝突の繰り返しに基づいて上記各突起 13b、13b に繰り返し加えられる力が、上記各周縁部 22b、22b 及び基部 23a、23a 全体に互ってより均等に加わる。この為、上述した第 1 例の保持器 4a に比べても、より一層応力集中を緩和できる。従って、本例の場合には、上述した第 1 例以上の耐久性を確保できる。その他の構成及び作用は、上述した第 1 例の場合と同様であるから、同等部分には同一符号を付して、重複する説明を省略する。

【0015】尚、上述した第1例及び第2例の保持器4 a、4 bは何れも、円すい筒状の主部を有する自動調心ころ軸受用、或は円すいころ軸受用の保持器に、本発明を適用したものである。これに対して、上記主部が円筒状である、円筒ころ軸受用の保持器にも、本発明を適用する事は可能である。更に、上述した第1例及び第2例の保持器4 a、4 bは何れも、外向フランジ部の片側面に上記各突起を形成したものであるが、内向フランジ部の片側面に上記各突起を設ける事もできる。この場合、上記保持器を構成する主部は、この保持器により転動自在に保持するころの回転中心（ピッチ円）よりも、上記保持器を組み込むころ軸受の直径方向外方に位置させる。

#### 【0016】

【発明の効果】本発明のころ軸受用保持器は、以上の様に構成され作用する為、特にコストを高くする事なく、耐久性を向上する事ができる。この結果、ころ軸受用保持器を組み込んだころ軸受の耐久性及び信頼性の向上を図れる。

#### 【図面の簡単な説明】

【図1】本発明の実施の形態の第1例を示す部分拡大斜視図。

【図2】図1のA-A断面図。

【図3】図2のB-B断面図。

【図4】本発明の実施の形態の第2例を示す、図2と同様の図。

様の図。

【図5】図4のC-C断面図。

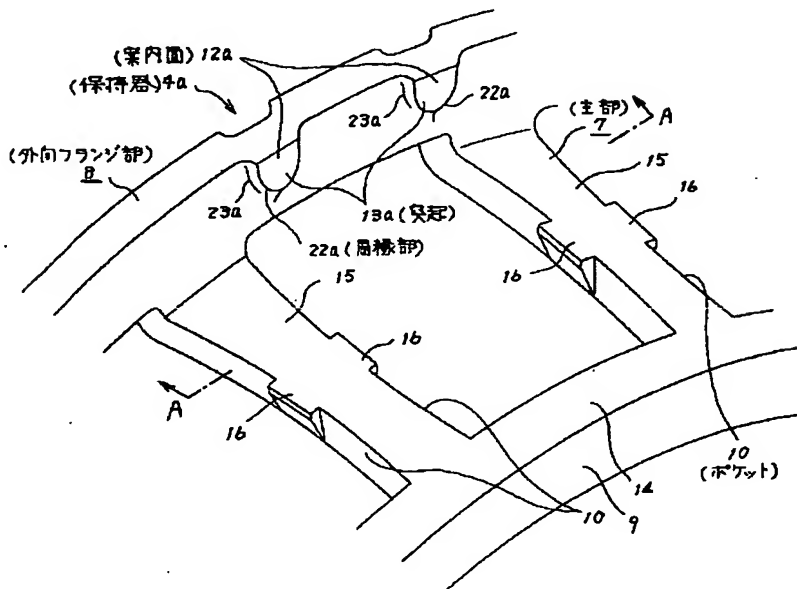
【図6】従来構造の1例を示す部分拡大斜視図。

【図7】本発明の保持器が組み込まれるころ軸受の一種である、自動調心ころ軸受の部分断面図。

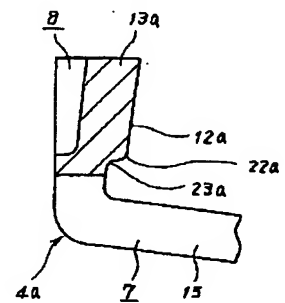
#### 【符号の説明】

- 1 外輪
- 2 内輪
- 3 球面ころ
- 4、4 a、4 b 保持器
- 5 外輪軌道
- 6 内輪軌道
- 7 主部
- 8 外向フランジ部
- 9 内向フランジ部
- 10 ポケット
- 11 端面
- 12、12 a、12 b 案内面
- 13、13 a、13 b 突起
- 14 円環部
- 15 柱部
- 16 突片
- 17 尖鋭部
- 22、22 a、22 b 周縁部
- 23、23 a 基部

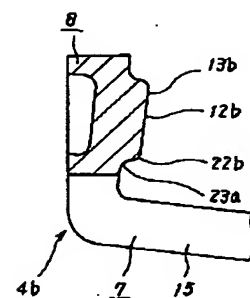
【図1】



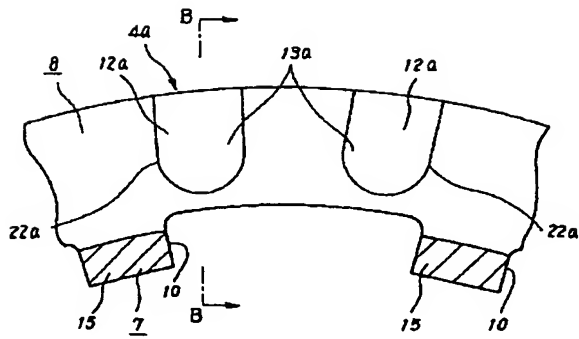
【図3】



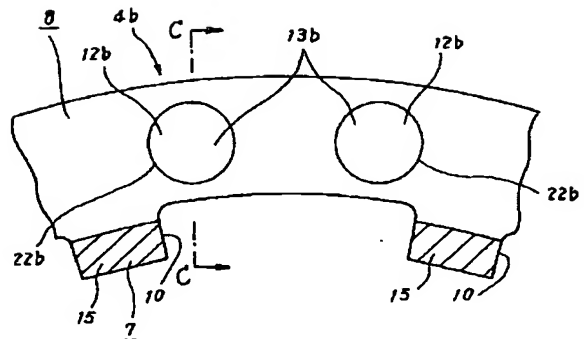
【図5】



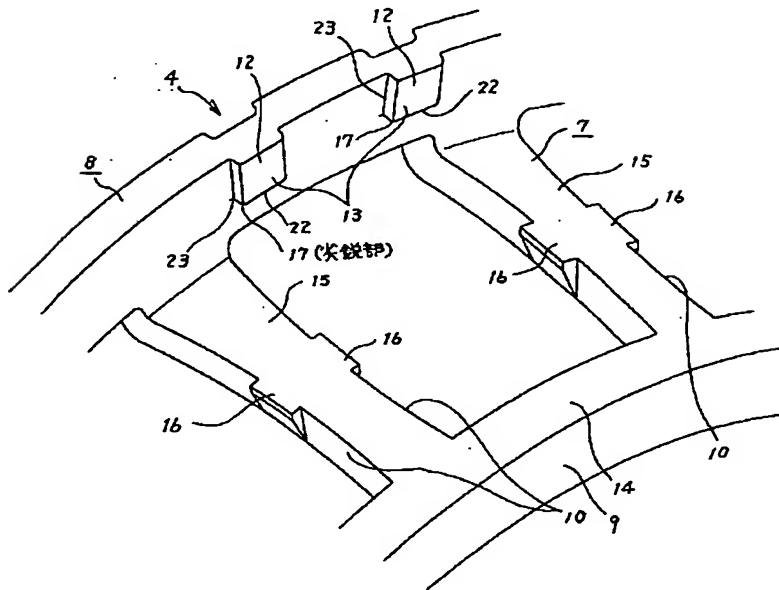
【図 2】



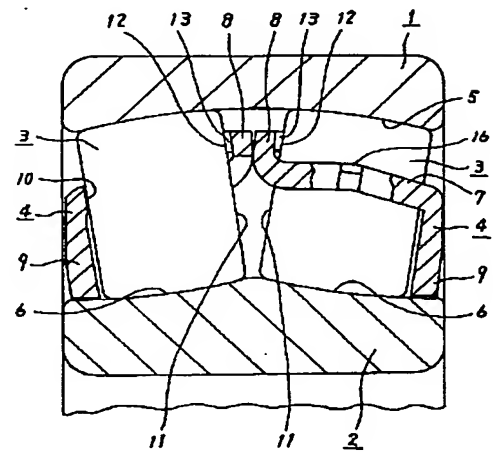
【図 4】



【図 6】



【図 7】



フロントページの続き

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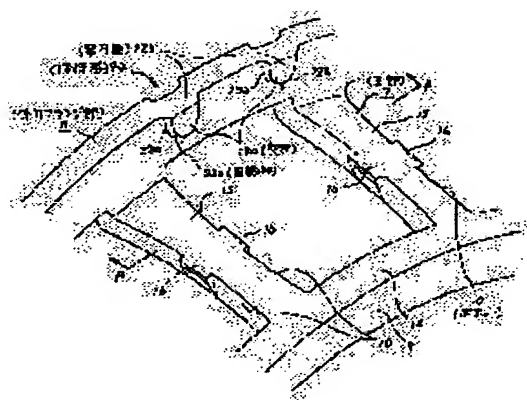
(21)Application number : 09-232797 (71)Applicant : NIPPON SEIKO KK  
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## (54) CAGE FOR ROLLER BEARING

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To prevent stress concentration on peripheral edge parts and base parts so as to prevent the generation of cracks and to improve durability by forming the peripheral edge parts partitioning the peripheries of guide faces, coming in sliding contact with the end face of each roller, of a cage, into circular arc shape.

**SOLUTION:** Out of peripheral edge parts 22a, 22a partitioning the peripheries of guide faces 12a, 12a of a cage 4a, at least the inner diameter side parts of the peripheral edge parts 22a, 22a to be sliding contact parts with the end face of each spherical roller are formed in semicircular arc shape so as to be of curved shape without acute part. Parts receiving stress on the basis of rubbing against the end face out of the respective peripheral edge parts 22a, 22a therefore have no sudden change part of shape, so that there is no partial concentration of stress generated to the respective peripheral edge parts 22a, 22a on the basis of rubbing against the end face. The radius of curvature of cross-sectional shape of parts corresponding to the semicircular arc shape parts out of base parts 23, 23a of protruding parts 13a, 13a is made large so as to release stress concentration on the respective base parts 23a, 23a.



## LEGAL STATUS

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## CLAIMS

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[Claim(s)]

[Claim 1] A principal piece cylindrical at the product made from a metal plate, or circular-cone tubed, and two or more pockets which covered the circumferencial direction of this principal piece and were prepared intermittently, The above-mentioned principal piece which bent from the end edge of the above-mentioned principal piece to the method of the outside of the diameter direction, or the inner direction, and the flange of one, Into the end face at two or more times held free [ rolling in each above-mentioned pocket ] in respect of one side of this flange, and the part which counters It is prepared at a time for every above-mentioned pocket in at least one condition of projecting towards the inside of each above-mentioned pocket. In the cage for roller bearing equipped with the projection which made the field which counters inside each above-mentioned pocket the slideway which \*\*\*\*s to the end face of each above-mentioned roller The cage for roller bearing characterized by making the configuration of the part concerned into a curvilinear configuration without the acute section by making into a radii form the configuration of the part which \*\*\*\*s to the end face of each above-mentioned roller at least among the periphery sections which divide the perimeter of the above-mentioned slideway.

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## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] The cage for roller bearing concerning this invention is built into self-aligning roller bearing, and is used for holding the spherical roller which constitutes this self-aligning roller bearing, enabling free rolling.

[0002]

[Description of the Prior Art] For example, self-aligning roller bearing as shown in drawing 7 is indicated by JP,8-296653,A. Between the outer rings of spiral wound gasket 1 and inner rings of spiral wound gasket 2 which were combined with this alignment, this self-aligning roller bearing is arranged for two or more spherical rollers 3 and 3 which correspond when indicated to the claim, enabling free rolling, and changes. And separation prevention of two or more above-mentioned spherical rollers 3 and 3 is aimed at with one pair of cages 4 and 4 which are cages for roller bearing. Each above-mentioned cages 4 and 4 are the so-called press cages which carry out press forming of the metal plate, and change.

[0003] The outer-ring-of-spiral-wound-gasket orbit 5 which is the spherical concave surface which has a single core is formed in the inner skin of the above-mentioned outer ring of spiral wound gasket 1. Moreover, each forms the above-mentioned outer-ring-of-spiral-wound-gasket orbit 5 and one pair of inner-ring-of-spiral-wound-gasket orbits 6 and 6 which counter in the crosswise (longitudinal direction of drawing 7) both sides of the peripheral face of an inner ring of spiral wound gasket 2. Moreover, the overall diameter section is a symmetry form in the center section of the shaft-orientations die length of each spherical rollers 3 and 3, and has arranged two or more above-mentioned spherical rollers 3 and 3 free [rolling] for the above-mentioned outer-ring-of-spiral-wound-gasket orbit 5 and the one above-mentioned pair of inner-ring-of-spiral-wound-gasket orbits 6 and 6 in two trains.

[0004] Each above-mentioned cages 4 and 4 are built like by [which were mentioned above] performing press working of sheet metal to metal plates, such as a steel plate. Each [these] cages 4 and 4 are equipped with the circular-cone tubed principal piece 7 and two or more pockets 10 and 10 which covered the circumferential direction of this principal piece 7, and were formed at equal intervals intermittently as shown in drawing 6. The turning-inward flange 9 which

bent the extroversion flange 8 equivalent to the flange indicated to the claim which bent from this major-diameter side edge edge to the method of the outside of the diameter direction from this minor diameter side edge edge to the method of the inside of the diameter direction at the minor diameter side edge edge (lower right edge of drawing 6 ) which is the other end edge of the above-mentioned principal piece 7 is formed in the major-diameter side edge edge (upper left edge of drawing 6 ) which is the end edge of the above-mentioned principal piece 7, respectively. Where such cages 4 and 4 are built into self-aligning roller bearing, in each above-mentioned pockets 10 and 10, the spherical rollers 3 and 3 (refer to drawing 7 ) per piece are held free [ rolling ], respectively.

[0005] Each above cage 4 is divided into two or more pillar sections 15 and 15 which connect the above-mentioned extroversion flange 8 prepared in the end section of the above-mentioned principal piece 7, the circular ring section 14 prepared in the other end of the above-mentioned principal piece 7, and these extroversion flange 8 and the circular ring section 14 by existence of two or more above-mentioned pockets 10 and 10. The above-mentioned turning-inward flange 9 is bent and formed in the outer edge edge of the above-mentioned circular ring section 14. In other words, each above-mentioned pockets 10 and 10 are formed in the pillar section 15 which adjoins the above-mentioned extroversion flange 8, the circular ring section 14, and a circumferencial direction, and the part which had the periphery surrounded by 15 comrades. He forms the protruding pieces 16 and 16 which project inside each above-mentioned pockets 10 and 10, respectively in the center section of each [ these ] pillar sections 15 and 15, and is trying for each above-mentioned spherical rollers 3 and 3 ( drawing 7 ) inserted in each [ these ] pockets 10 and 10 from the bore side to fall out, and not to come out to it at an outer-diameter side.

[0006] Moreover, in respect of one side of the above-mentioned extroversion flange 8, in each above-mentioned pocket 10 and 10, projections 13 and 13 are turned inside each above-mentioned pockets 10 and 10, and are projected and formed at the end faces 11 and 11 ( drawing 7 ) of two or more spherical rollers 3 and 3 held free [ rolling ], and the part which counters. Each [ these ] projections 13 and 13 are each above-mentioned pocket 10 and the thing prepared for every ten in the condition of having made the circumferencial direction mutually isolated two pieces at a time, and make the field which counters inside each above-mentioned pockets 10 and 10 the slideways 12 and 12 which \*\*\*\* to the end faces 11 and 11 of each above-mentioned spherical rollers 3 and 3. When it includes in the self-aligning roller bearing which showed the cage 4 to drawing 7 , the slideways 12 and 12 of each above-mentioned projections 13 and 13 projected inside each above-mentioned pockets 10 and 10 approach or \*\*\*\* to the end faces 11 and 11 of each above-mentioned spherical rollers 3 and 3, and the other end side of each [ these ] spherical rollers 3 and 3 \*\*\*\*s or approaches with the inner edge of the circular ring section 14. For this reason, it can prevent effectively that each [ these ] spherical rollers 3 and 3 displace to each above-mentioned pockets 10 and 10. That is, between the inner edges of the both-ends side of each above-mentioned spherical rollers 3 and 3, the slideways 12 and 12 of each above-mentioned projections 13 and 13, or the above-mentioned circular

ring section 14, even if a clearance does not exist or it exists, only few clearances exist. For this reason, even if the medial axis of each [ these ] spherical rollers 3 and 3 does not incline to the center line of each above-mentioned pockets 10 and 10 or inclines, it does not carry out a \*\*\*\* small deer inclination. Since the core of the big cage 4 of a path hardly inclines to the core of self-aligning roller bearing, if it prevents that each above-mentioned spherical rollers 3 and 3 incline by the inside of each above-mentioned pockets 10 and 10, it can prevent certainly that each [ these ] spherical rollers 3 and 3 carry out a skew.

[0007]

[Problem(s) to be Solved by the Invention] In the case of the conventional cage for roller bearing constituted as mentioned above, the edge configuration of each above-mentioned slideways 12 and 12 is made into the rectangle. therefore -- the periphery sections 22 and 22 which divide the perimeter of each [ these ] slideways 12 and 12 -- radius of curvature -- \*\*\*\* -- the small acute sections 17 and 17 (refer to drawing 6 ) exist. Moreover, the radius of curvature of the bases 23 and 23 of each projections 13 and 13 is also fairly small. When for this reason each above-mentioned slideways 12 and 12 and the end face of spherical rollers 3 and 3 rub or each above-mentioned slideways 12 and 12 and the end faces 11 and 11 of spherical rollers 3 and 3 collide repeatedly, stress concentrates on each above-mentioned acute sections 17 and 17 or bases 23 and 23, and it is especially easy to generate the damage on a crack etc. into each [ these ] bases 23 and 23 and the part near each above-mentioned acute sections 17 and 17. This invention prevents concentration of such stress, and it invents it so that it may aim at improvement in endurance of the cage for roller bearing.

[0008]

[Means for Solving the Problem] The cage for roller bearing of this invention is equipped with a principal piece cylindrical at the product made from a metal plate, or circular-cone tubed, two or more pockets which covered the circumferential direction of this principal piece and were prepared intermittently, and the above-mentioned principal piece which bent from the end edge of the above-mentioned principal piece to the method of the outside of the diameter direction, or the inner direction and the flange of one like the conventional cage for roller bearing mentioned above. And the projection per piece [ at least ] is prepared in the end face at two or more times held free [ rolling in each above-mentioned pocket ] in respect of one side of this flange, and the part which counters for every above-mentioned pocket in the condition of projecting towards the inside of each above-mentioned pocket. Each [ these ] projection makes the field which counters inside each above-mentioned pocket the slideway which \*\*\*\*s to the end face of each above-mentioned roller. Especially the cage for roller bearing of this invention makes the configuration of the part concerned the curvilinear configuration without the acute section by making into a radii form the configuration of the part which \*\*\*\*s to the end face of each above-mentioned roller at least among the periphery sections which divide the perimeter of the above-mentioned slideway.

[0009]

[Function] Also when the above-mentioned slideway and the end face at the time

rub or it collides repeatedly at the time of use by making into a radii form the configuration of the periphery section which divides the perimeter of the above-mentioned slideway in the case of the cage for roller bearing of this invention mentioned above, it is hard coming to generate big stress concentration in the above-mentioned periphery section and a base, and hard coming to generate the damage on a crack etc. in this base.

[0010]

[Embodiment of the Invention] Drawing 1 -3 show the 1st example of the gestalt of operation of this invention. The basic structure of the cage for roller bearing of this example is the same as structure conventionally which was mentioned above. Especially the cage for roller bearing of this example Slideway 12a of Projections 13a and 13a, The configuration of the part which \*\*\*\*s to the end face 11 (refer to drawing 7 ) of each spherical roller 3 at least among the periphery sections which divide the perimeter of 12a is made into a curvilinear configuration without the acute sections 17 and 17 (refer to drawing 6 ). The point which enlarges the radius of curvature of the cross section of the bases 23a and 23a of each above-mentioned projections 13a and 13a in connection with this differs from structure conventionally. the explanation which gives the same sign to an equivalent part and overlaps since the structure of other parts and an operation are the same as that of structure fundamentally conventionally which was shown in above-mentioned drawing 6 -- an abbreviation -- or it is made simple and explains focusing on the description part of this invention hereafter.

[0011] In cage 4a which is the cage for roller bearing of this example The inside of the periphery sections 22a and 22a which divide the perimeter of the above-mentioned slideways 12a and 12a, The configuration for this bore flank is made into the curvilinear configuration without each above-mentioned acute sections 17 and 17 (refer to drawing 6 ) by using the configuration of a part as semicircle arc type the bore side (under drawing 1 -2) of each above-mentioned periphery sections 22a and 22a used as the part which \*\*\*\*s to the end face 11 of each above-mentioned spherical roller 3 at least.

[0012] Cage 4a of this example is using as semicircle arc type the configuration of the part which rubs against the end face 11 of a spherical roller 3 among the periphery sections 22a and 22a of each above-mentioned slideways 12a and 12a as mentioned above. For this reason, among each above-mentioned periphery sections 22a and 22a, in the part with the above-mentioned end face 11 which is based on rubbing and receives stress, there is no part from which a configuration changes rapidly, and it is lost into it that the stress with the above-mentioned end face 11 which is based on rubbing and is generated in each above-mentioned periphery sections 22a and 22a concentrates partially. Moreover, in connection with having used the configuration of the above-mentioned periphery sections 22a and 22a as semicircle arc type, the radius of curvature of the cross-section configuration of the part corresponding to a part for the above-mentioned semicircle arch is enlarged among the bases 23a and 23a of each above-mentioned projections 13a and 13a. Therefore, the stress concentration to each above-mentioned bases 23a and 23a is also eased. Consequently, at the time of use of cage 4a of this example, it is hard coming to generate the damage on a

crack etc. in each above-mentioned projections 13a and 13a, and the endurance of the above-mentioned cage 4a improves.

[0013] As mentioned above, when only a bore side changes the configuration of the periphery sections 22a and 22a of each above-mentioned slideways 12a and 12a, conventionally, to structure, cage 4a of this example is the minimum modification, and has attained the improvement in endurance which is the purpose of this invention. In addition, if the cross-section configuration it not only makes a radii form the configuration of periphery section 22a which expressed a part for the bore flank which rubs against the end face 11 of the above-mentioned spherical roller 3 among the above-mentioned periphery sections 22a and 22a to drawing 1 -2, and the 22a itself, but where it expressed it to drawing 3 is made into the radii form where radius of curvature is big, as much as possible, it rubs and the stress concentration based on the collision of \*\*\*\*\* with the above-mentioned end face 11 can be eased further.

[0014] Next, drawing 4 -5 show the 2nd example of the gestalt of operation of this invention. In cage 4b of this example, the configuration of the periphery sections 22b and 22b of the slideways 12b and 12b of Projections 13b and 13b is formed circularly. Thus, when the configuration of each [ these ] periphery sections 22b and 22b is made circular, the force of the end face 11 of a spherical roller 3 and each above-mentioned slideways 12b and 12b which rubs and is repeatedly applied to each above-mentioned projections 13b and 13b based on the repeat of a collision covers each above-mentioned periphery sections 22b and 22b and base 23a, and the whole 23a, and is added more equally. Even if compared with cage of 1st example 4a mentioned above for this reason, stress concentration can be eased further. Therefore, in this example, the endurance of the 1st more than example mentioned above is securable. Since other configurations and operations are the same as that of the case of the 1st example mentioned above, the same sign is given to an equivalent part and they omit the overlapping explanation.

[0015] In addition, the cages 4a and 4b of the 1st example and the 2nd example mentioned above all apply this invention to the cage the object for self-aligning roller bearing which has a circular-cone tubed principal piece, or for circular-cone roller bearing. On the other hand, the above-mentioned principal piece is able to apply this invention also to the cylindrical cage for cylindrical roller bearings. Furthermore, all, although the cages 4a and 4b of the 1st example and the 2nd example mentioned above form each above-mentioned projection in the single-sided field of an extroversion flange, they can also prepare each above-mentioned projection in the single-sided field of a turning-inward flange. In this case, the principal piece which constitutes the above-mentioned cage is located in the method of the outside of the diameter direction of the roller bearing incorporating the above-mentioned cage rather than the center of rotation at the time of holding free [ rolling ] with this cage (pitch circle).

[0016]

[Effect of the Invention] The cage for roller bearing of this invention can improve endurance, without making especially cost high, in order to be constituted as mentioned above and to act. Consequently, improvement in the endurance of the roller bearing incorporating the cage for roller bearing and dependability can be

aimed at.

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## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The partial expansion perspective view showing the 1st example of the gestalt of operation of this invention.

[Drawing 2] The A-A sectional view of drawing 1 .

[Drawing 3] The B-B sectional view of drawing 2 .

[Drawing 4] The same drawing as drawing 2 showing the 2nd example of the gestalt of operation of this invention.

[Drawing 5] The C-C sectional view of drawing 4 .

[Drawing 6] The partial expansion perspective view showing one example of structure conventionally.

[Drawing 7] The self-aligning roller bearing-~~portions~~ sectional view where the cage of this invention is incorporated and which is a kind of roller bearing.

[Description of Notations]

1 Outer Ring of Spiral Wound Gasket

2 Inner Ring of Spiral Wound Gasket

3 Spherical Roller

4, 4a, 4b Cage

5 Outer-Ring-of-Spiral-Wound-Gasket Orbit

6 Inner-Ring-of-Spiral-Wound-Gasket Orbit

7 Principal Piece

8 Extroversion Flange

9 Turning-Inward Flange

10 Pocket

11 End Face

12, 12a, 12b Slideway

13, 13a, 13b Projection

14 Circular Ring Section

15 Pillar Section

16 Protruding Piece

17 Acute Section

22, 22a, 22b Periphery section

23 23a Base

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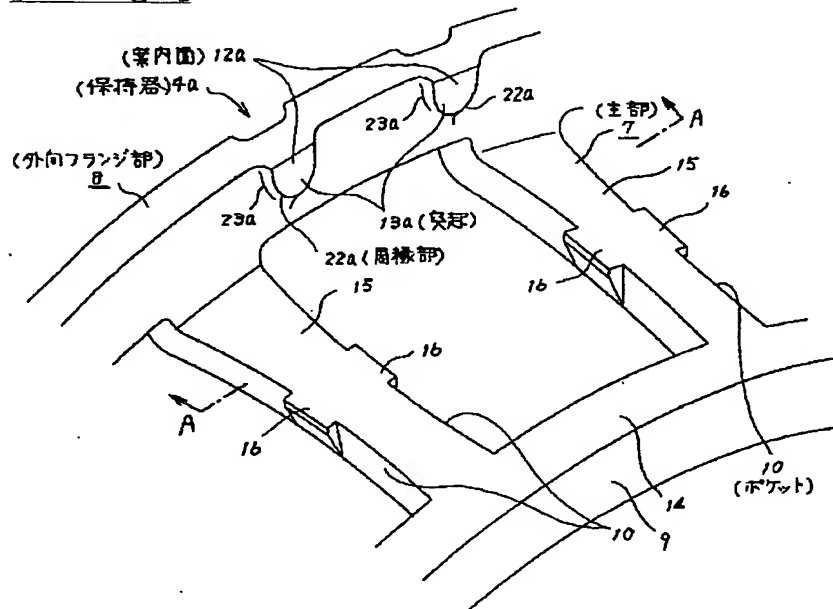
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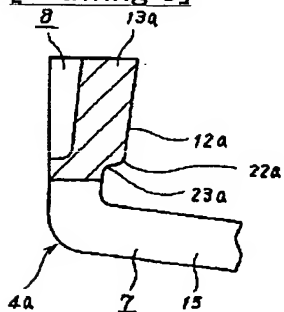
DRAWINGS

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[Drawing 1]

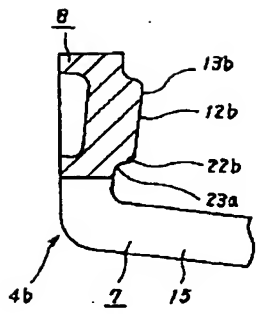


[Drawing 3]

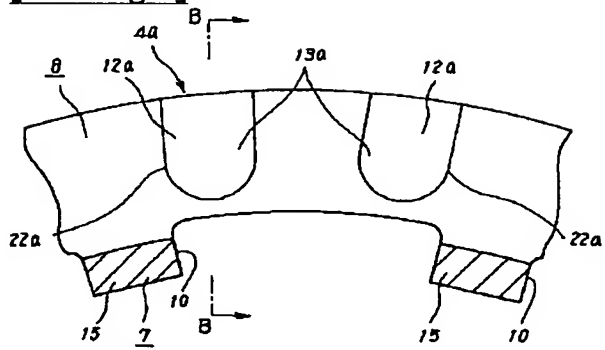


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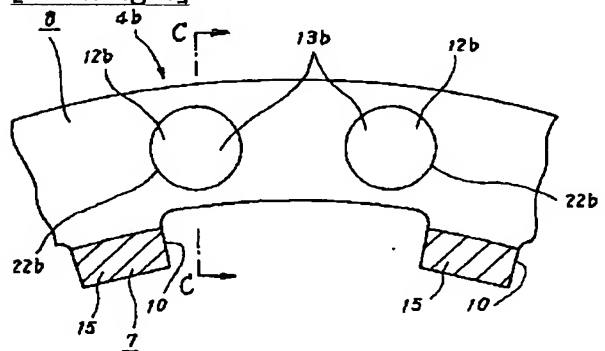




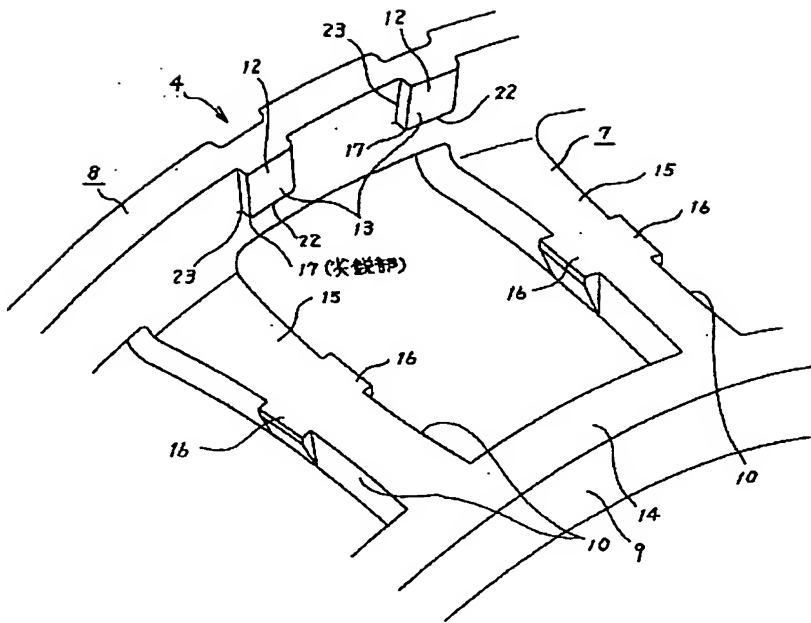
[Drawing 2]



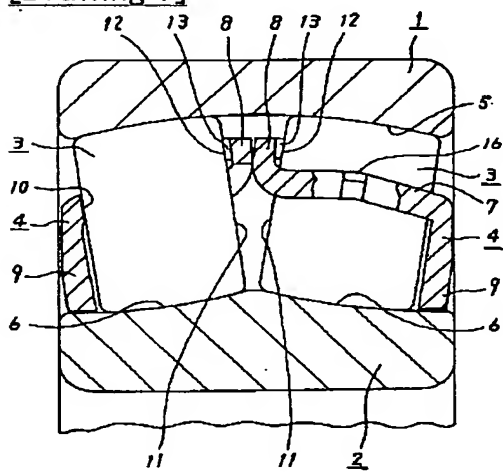
[Drawing 4]



[Drawing 6]



[Drawing 7]



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